

CLAIMS

- 1 1. A system for modulating the flow of air to be supplied to a
2 space, the system comprising:
3 a plenum adapted for supplying pressurized air;
4 a ventilation module having an upper area and a lower area, the
5 ventilation module adapted to be in communication with the plenum for
6 receiving air from the plenum and conveying the air to the space;
7 a grille located proximate the upper area of the module for
8 diffusing air exiting the ventilation module into the space;
9 a first apertured plate arranged in a plane and located below the
10 grille, the first apertured plate having a plurality of holes defining a gross
11 aperture area exposed to the plenum for providing a constant velocity flow
12 of air.
- 1 2. The system of claim 1, further comprising a second apertured
2 plate located proximate the first apertured plate, the apertured plates being
3 movable with respect to each other to define a net aperture area exposed to
4 the plenum.
- 1 3. The system of claim 2, wherein the net aperture area is variable
2 to affect the volume of air passing the apertured plates while maintaining a
3 substantially constant velocity of the air passing the apertured plates.
- 1 4. The system of claim 1, wherein the grille comprises a first set
2 of cross members, a second set of cross members, and a third set of cross

3 members, each set of cross members having predetermined angles different
4 than the other two sets of cross members.

1 5. The system of claim 2, wherein the first and second apertured
2 plates each have a lead aperture and a lag aperture; and further wherein at
3 least the lead aperture in the second plate is larger than the lead aperture in
4 the first plate.

1 6. The system of claim 2, further comprising an actuator
2 connected to one of the first and second plates to move the plate for
3 simultaneously modulating the flow from the apertured plates.

1 7. The system of claim 6, wherein the system maintains
2 approximately constant air jet velocity and an elevated level of room air
3 mixing through a large range of plenum air flow.

1 8. A system to modify the flow characteristics of a linear bar type
2 supply air grille to enhance its performance when applied to a perimeter
3 located, under-floor air distribution system, the system comprising:
4 a plenum adapted for supplying pressurized air;
5 a ventilation module having an upper area and a lower area, the
6 ventilation module adapted to be in communication with the plenum for
7 receiving air from the plenum and conveying the air to the space;
8 a first apertured plate arranged in a plane and located below the
9 grille, the first apertured plate having a plurality of holes defining a gross
10 aperture area exposed to the plenum for providing a constant velocity flow
11 of air; and

12 a second apertured plate located proximate the first apertured
13 plate, the apertured plates being movable with respect to each other to
14 define a net aperture area exposed to the plenum.

1 9. The system of claim 8, wherein the net aperture area is variable
2 to affect the volume of air passing the apertured plates while maintaining a
3 substantially constant velocity of the air passing the apertured plates.

1 10. The system of claim 8, wherein the grille is located proximate
2 the upper area of the module for diffusing air exiting the ventilation module
3 into the space and wherein the first apertured plate is fixedly located above
4 the second apertured plate which is movable relative to the first apertured
5 plate.

1 11. The system of claim 10, wherein the first and second apertured
2 plates each have a lead aperture and a lag aperture; and further wherein at
3 least the lead aperture in the second plate is larger than the lead aperture in
4 the first plate.

1 12. The system of claim 11, further comprising an actuator
2 connected to second apertured plate to move the second apertured plate for
3 modulating the flow from the apertured plates and further wherein the
4 system maintains approximately constant air jet velocity and an elevated
5 level of room air mixing through a large range of plenum air flow.

1 13. A system for passively inducing supplied air to increase the
2 heating output of the system, the system comprising:

3 a heating module adapted to be located in a space, the heating
4 module including a partition and a heating element, the heating module
5 having a top open portion to allow heated air to flow;

6 a ventilation module for being located in a space, the ventilation
7 module having an upper area and a lower area, the ventilation module
8 adapted to be in communication with a plenum adapted for supplying
9 pressurized air, wherein the ventilation module is designed to be juxtaposed
10 the heating module;

11 a first apertured plate arranged in a plane and located in the
12 ventilation module, the first apertured plate having a plurality of holes
13 defining a gross aperture area exposed to the plenum for providing a
14 constant velocity flow of air;

15 a second apertured plate located proximate the first apertured
16 plate, the apertured plates being movable with respect to each other to
17 define a net aperture area exposed to the plenum.

1 14. The system of claim 13, further comprising second ventilation
2 module located on an opposite side of the heating module from the first
3 ventilation module

1 15. The system of claim 14, wherein the second ventilation module
2 comprises a first apertured plate arranged in a plane and located in the
3 ventilation module, the first apertured plate having a plurality of holes
4 defining a gross aperture area exposed to the plenum for providing a
5 constant velocity flow of air and a second apertured plate located proximate
6 the first apertured plate in the second ventilation module, the apertured
7 plates of the second ventilation module being movable with respect to each
8 other to define a net aperture area exposed to the plenum.

1 16. The system of claim 14 further comprising an actuator
2 connected to the first and second ventilation.

1 17. The system of claim 15 further comprising an actuator
2 connected to the second plate of the first ventilation module and the second
3 plate of the second ventilation module for controlling the net aperture area
4 exposed to the plenum in each ventilation module.

1 18. The system of claim 13 wherein the heating module and the
2 ventilation module each have a length greater than its width and wherein the
3 heating module and the ventilation module have their lengths aligned and are
4 adapted to be installed in an under-floor, perimeter location within a space.

1 19. The system of claim 18 further comprising a second ventilation
2 module; and wherein the heating module and the first and second ventilation
3 modules all have a length greater than their width and wherein the heating
4 module and the first and second ventilation modules have their lengths
5 aligned and are all adapted to be installed in an under-floor, perimeter
6 location within a space wherein the heating module is located between the
7 first and second ventilation modules.

1 20. The system of claim 10 wherein the lead aperture in the second
2 plate is located for early engagement with an aperture in the first plate.